

## **REMARKS/ARGUMENTS**

### **STATUS OF CLAIMS**

Claims 1-3 and 8-18 are now pending in this application. Claims 4-7 were previously canceled without prejudice or disclaimer.

### **SUMMARY OF THE OFFICE ACTION**

The outstanding Office Action is a final Action that presents a rejection of claims 1, 2, 8, 10, 12, 13, and 16 under 103(a) as being unpatentable over Cheetham et al. (U.S. Patent Application Publication No. 2005/0077499, hereinafter “Cheetham”) in view of Tamaki<sup>1</sup> et al. (U.S. Patent No. 6,780,346, hereinafter “Tamaki”), a rejection of claims 3, 11, 14, 15, and 18 under 103(a) as being unpatentable over Cheetham in view of Tamaki and further in view of Henrichs (U.S. Patent No. 6,625,195, hereinafter “Henrichs”), a rejection of claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Cheetham in view of Tamaki and further in view of Justel<sup>2</sup> et al. (U.S. Patent No. 6,084,250, hereinafter “Justel”), and a rejection of claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Cheetham in view of Tamaki and further in view of Henrichs and Justel.

### **103 REJECTION OF CLAIMS 1, 2, 8, 10, 12, 13, AND 16**

Item 4 on page 2 of the outstanding Action sets forth the above-noted rejection of claims 1, 2, 8, 10, 12, 13, and 16 as being unpatentable over Cheetham in view of Tamaki. This rejection is traversed.

Independent claim 1 recites the following invention:

A light-emitting device comprising:

a semiconductor excitation light source emitting blue-violet light, and

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<sup>1</sup> The outstanding Action apparently includes a typographical error in referring this reference as “Tanaki” instead of the actual name “Tamaki” that appears on U.S. Patent No. 6,780,346.

<sup>2</sup> The outstanding Action apparently includes a typographical error in referring this reference as “Juestel” instead of the actual name “Justel” that appears on U.S. Patent No. 6,084,250.

a solid material illuminant that is made up of a medium that transmits the blue-violet light with low loss and an absorbent for absorbing said blue-violet light, the absorbent containing Sm of 0.01 to 10 mol%, wherein

said solid material illuminant radiates light by inner shell transition of the Sm contained in the absorbent absorbing the blue-violet light, and

said solid material illuminant medium is selected from the group consisting of GaN, AlN, InGaN, InAlN, InGaAlN, Si<sub>3</sub>N<sub>4</sub>, GaNP, AlNP, InGaNp, InAlNP, InGaAlNP, GaNAs, AlNAs, InGaNAs, InAlNAs, InGaAlNAs, GaNAsP, AlNAsP, InGaNAsP, InAlNAsP, InGaAlNAsP, ZnSe, and ZnSSe.

Thus, the claimed light-emitting device must include “a solid material illuminant that is made up of a medium that transmits the blue-violet light with low loss and an absorbent for absorbing said blue-violet light, the absorbent containing Sm of 0.01 to 10 mol%” (emphasis added) has to be selected from the listed group that excludes oxide based materials.

The light emitting device of Cheetham is taught at paragraph [0019] to include phosphors that include an improved red phosphor that are applied as a layer to a light emitting element like a GaN die. Note the following from paragraph [0019] of Cheetham:

The combination of phosphors can be applied as a layer to a light emitting semiconductor device such as a VCSEL, LED or LD. For example the combination can be applied as a layer to a GaN die and encapsulated by a lens typically formed of a transparent epoxy. In operation, electrical power is supplied to the GaN die to activate it, which then emits light that activates the phosphors to emit output light of combined wavelengths and which will vary depending on the spectral distribution and intensities of the light emitted from the phosphors. See, for example, the description of the prior art phosphor LED in Lowery, et al. U.S. Pat. No. 6,351,069, the disclosure of which is incorporated herein by reference. The present invention enables the emitted wavelengths to have a combined spectral distribution such that it appears to be "white" light.

While the incorporated teachings from Lowery, et al. (U.S. Pat. No. 6,351,069, hereinafter “Lowery”) include the use of a phosphor-resin mixture which is described in terms of fluorescent materials that are combined with a resin paste, nothing is taught in Lowery or Cheetham that suggests the use of the independent claim 1 medium of solid material illuminant that has to be transparent to the blue-violet light and “is selected from the group consisting of

GaN, AlN, InGaN, InAlN, InGaAlN, Si<sub>3</sub>N<sub>4</sub>, GaNP, AlNP, InGaNP, InAlNP, InGaAlNP, GaNAS, AlNAS, InGaNAs, InAlNAS, InGaAlNAS, GaNASP, AlNASP, InGaNAsP, InAlNASP, InGaAlNASP, ZnSe, and ZnSSe.”

Instead, Cheetham actually teaches away from the claimed invention in relied upon paragraph [0006] by noting that the above-noted improved red phosphor that is applied as a layer to a light emitting element, like a GaN die, is an oxide based material. In particular, paragraph [0006] teaches that the red phosphor has the general formula “Bi<sub>x</sub>Ln<sub>1-x</sub>VO<sub>4</sub>:A, i.e., an oxide.

Similarly, nothing is taught in Lowery or Cheetham that suggests the use of the independent claim 12 medium of solid material illuminant that also has to be transparent to the blue-violet light and must contain “at least one of nitrides of Ga, In, and Al.” Once again, Cheetham actually teaches away from the claimed invention in relied upon paragraph [0006] by noting that the above-noted improved red phosphor that is applied as a layer to a light emitting element, like a GaN die, is an oxide based material.

To cure this deficiency of Cheetham, the Examiner turns to Tamaki and alleges that this reference teaches “said solid illuminant medium is selected from the group consisting of GaN, AlN, InGaN, InAlN, InGaAlN, Si<sub>3</sub>N<sub>4</sub>, GaNP, AlNP, InGaNP, InAlNP, InGaAlNP, GaNAS, AlNAS, InGaNAs, InAlNAS, InGaAlNAS, GaNASP, AlNASP, InGaNAsP, InAlNASP, InGaAlNASP, ZnSe, and ZnSSe (Column 2, lines 25-35) (GaN) in order to provide a device with improved luminous efficiency (column 2, lines 20-23).”

However, in order to reach the conclusion that Tamaki teaches (at Column 2, lines 25-35) that “said solid illuminant medium” is GaN for “improved luminous efficiency (column 2, lines 20-23)” the outstanding Action is clearly misinterpreting the teachings of Tamaki. In this regard the actual Tamaki teaching (at col. 2, lines 25-35), is that a **PHOSPHER** of the general formula (Ga,In)N:X,Y is treated with a particular surface treatment compound that includes the phosphates noted at lines 26-30 of column 2 (or Sb as noted at col. 2, lines 10-12) so that the surface treated **PHOSPHER** has the improved “luminous efficiency” noted at col. 2, lines 20-23.

Thus, to the extent that Tamaki teaches nitride materials, these are not taught to be solid material illuminant medium materials but the illuminating phosphor materials themselves.

Therefore, whatever the combination of Cheetham in view of Tamaki might disclose, teach, or suggest, it is different from an absorbent containing Sm for efficiently absorbing blue-violet light, and a solid material illuminant including the absorber as in the presently claimed invention.

Further clearly missing from the outstanding Action is the required analysis as to why the Tamaki taught GaN **PHOSPHER** with the required P or Sb surface treating compound would be considered by the artisan to be the claimed “solid material illuminant” that has to be “transparent to the blue-violet light” and that must radiate “light by inner shell transition of the Sm contained in the absorbent absorbing the blue-violet light” as claimed. The PTO reviewing court has emphasized that conclusory findings like these that omit analysis as to all of the relevant claim limitations are improper. *See Gechter v. Davidson*, 116 F.3d 1454, 1460, 43 USPQ2d 1030, 1035 (Fed. Cir. 1997).

Also missing is the Supreme Court required “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int'l v. Teleflex Inc.*, 127 S.Ct. 1727, 82 USPQ.2d 1385, 1396 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)). In this regard note that MPEP § 706.02(j) also requires an explanation in which the Examiner identifies “the proposed modification of the applied reference(s) (here the modification of Cheetham by Tamaki) necessary to arrive at the claimed subject matter.”

Furthermore, to whatever extent that paragraph [0033] of Cheetham teaches that Sm<sup>3+</sup> (as Sm<sub>2</sub>O<sub>3</sub>) dopant can be “added at a doping concentration of about 5 mol%,” this concentration is noted as to be relative to the concentration “of the Ln<sup>3+</sup> + Bi<sup>3+</sup>” and not that the absorbent contains “Sm of 0.01 to 10 mol%” as specified by independent claims 1 and 12.

In view of the above, independent claims 1 and 12 and claims 2, 8, and 10 that ultimately depend on independent claim 1, and claims 13 and 16 that ultimately depend on independent claim 12, are respectfully submitted to be clearly patentable over the reasonable teachings and fair suggestions of Cheetham in view of Tamaki. Accordingly, the withdrawal of the rejection of claims 1, 2, 8, 10, 12, 13, and 16 under 35 U.S.C. § 103(a) as being unpatentable over Cheetham in view of Tamaki is respectfully requested.

### **REJECTION OF CLAIMS 3, 11, 14, 15, AND 18**

Item 5 on page 6 of the outstanding Action sets forth the above-noted rejection of claims 3, 11, 14, 15, and 18 under 35 U.S.C. § 103(a) as being unpatentable over Cheetham in view of Tamaki and further in view of Henrichs. This rejection is traversed.

Henrichs is cited as to the subject matter added by dependent claims 3, 11, 14, 15, and 18 that depend from respective independent claims 1 and 12. However, to whatever extent that Henrichs may or may not teach this subject matter, it is clear that Henrichs does not cure the deficiencies noted above as to the reliance on Cheetham in view of Tamaki. Accordingly, dependent claims 3, 11, 14, 15, and 18 patentably define over the applied references for at least the same reason that respective parent independent claims 1 and 12 do. Therefore, withdrawal of this improper rejection of claims 3, 11, 14, 15, and 18 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Cheetham in view of Tamaki in further view of Henrichs is respectfully requested.

### **REJECTION OF CLAIM 9**

Item 6 on page 7 of the outstanding Action sets forth the above-noted rejection of claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Cheetham in view of Tamaki in further view of Justel.

To whatever extent that Justel teaches or does not teach phosphors as containing rare earth elements, the subject matter of dependent claim 9, it does not cure the above-noted deficiencies of Cheetham in view of Tamaki. Accordingly, dependent claim 9 patentably defines over the applied references for at least the same reason that parent independent claim 1 does and withdrawal of this improper rejection of claim 9 under 35 U.S.C. §103(a) as being allegedly unpatentable over Cheetham in view of Tamaki in further view of Justel is respectfully requested.

### **REJECTION OF CLAIM 17**

Item 7 on page 7 of the outstanding Action sets forth the above-noted rejection of claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Cheetham in view of Tamaki in further view of Henrichs and Justel. This rejection is traversed.

Henrichs and Justel are cited as to the subject matter added by dependent claim 17 to dependent claim 15 that ultimately depends from independent claim 12. However, to whatever extent that Henrichs and Justel may or may not teach the subject matter added by dependent claim 17 to dependent claim 15, it is clear that Henrichs and/or Justel do not cure the deficiencies noted above as to the reliance on Cheetham in view of Tamaki as to ultimate parent independent claim 12. Accordingly, dependent claim 17 patentably defines over the applied references for at least the same reason that parent independent claim 12 does. Therefore, withdrawal of this improper rejection of claim 17 under 35 U.S.C. §103(a) as being allegedly unpatentable over Cheetham in view of Tamaki in further view of Henrichs and Justel is respectfully requested.

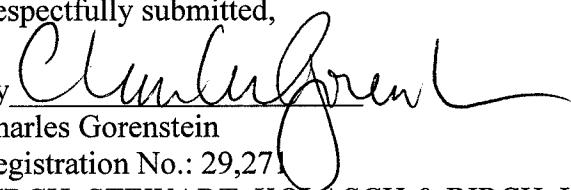
**CONCLUSION**

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Raymond F. Cardillo, Jr., Reg. No. 40,440 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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